What is claimed is:

1. A beam homogenizer for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising a light guide for homogenizing an energy distribution of the laser light along a width direction of the line-shape on the irradiated surface.

2. The beam homogenizer according to claim 1, wherein said light guide comprises two reflective surfaces facing to each other.

3. A beam homogenizer for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising a light pipe for homogenizing an energy distribution of the laser light along a width direction of the line-shape on the irradiated surface.

4. The beam homogenizer according to claim 3, wherein said light pipe comprises two reflective surfaces facing to each other.

5. A beam homogenizer for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a light guide for homogenizing an energy distribution of the laser light along a width direction of the line-shape on the irradiated surface; and

at least one cylindrical lens for condensing light output from said light guide along a width direction of the line-shape on the irradiated surface.

6. The beam homogenizer according to claim 5, wherein said light guide comprises two reflective surfaces facing to each other.

7. A beam homogenizer for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a light pipe for homogenizing an energy distribution of the laser light along a width direction of the line-shape on the irradiated surface; and

at least one cylindrical lens for condensing light output from said light pipe along a width direction of the line-shape on the irradiated surface.

8. The beam homogenizer according to claim 7, wherein said light pipe comprises two reflective surfaces facing to each other.

9. A beam homogenizer for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a unit for homogenizing an energy distribution of the laser light along a length direction of the line-shape on the irradiated surface; and

a light guide for homogenizing the energy distribution along a width direction of the line-shape on the irradiated surface,

wherein said unit has at least a cylindrical lens array.

10. The beam homogenizer according to claim 9, wherein said light guide comprises two reflective surfaces facing to each other.

11. A beam homogenizer for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a unit for homogenizing an energy distribution of the laser light along a length direction of the line-shape on the irradiated surface; and

a light pipe for homogenizing the energy distribution along a width direction of the line-shape on the irradiated surface,

wherein said unit has at least a cylindrical lens array.

12. The beam homogenizer according to claim 11, wherein said light pipe comprises two reflective surfaces facing to each other.

13. A laser irradiation apparatus for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a laser oscillator; and

a beam homogenizer,

wherein said beam homogenizer has a light guide for homogenizing an energy distribution of the laser light along a width direction of the line-shape.

14. The laser irradiation apparatus according to claim 13, wherein said laser oscillator is an excimer laser, a YAG laser, or a glass laser.

15. The laser irradiation apparatus according to claim 13, wherein said laser oscillator is a YVO_4 laser, a YLF laser, or an Ar laser.

16. A laser irradiation apparatus for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a laser oscillator;

a beam homogenizer,

wherein said beam homogenizer has a light guide for homogenizing an energy distribution of the laser light along a width direction of the line-shape, and

said light guide comprises two reflective surfaces facing to each other.

17. The laser irradiation apparatus according to claim 16, wherein said laser oscillator is an excimer laser, a YAG laser, or a glass laser.

18. The laser irradiation apparatus according to claim 16, wherein said laser oscillator is a YVO_4 laser, a YLF laser, or an Ar laser.

19. A laser irradiation apparatus for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a laser oscillator; and

a beam homogenizer,

wherein said beam homogenizer has a light pipe for homogenizing an energy distribution of the laser light along a width direction of the line-shape.

20. The laser irradiation apparatus according to claim 19, wherein said laser oscillator is an excimer laser, a YAG laser, or a glass laser.

21. The laser irradiation apparatus according to claim 19, wherein said laser oscillator is a YVO_4 laser, a YLF laser, or an Ar laser.

22. A laser irradiation apparatus for shaping a beam spot of a laser light on an irradiated surface into a line-shape, comprising:

a laser oscillator; and

a beam homogenizer,

wherein said beam homogenizer has a light pipe for homogenizing an energy distribution of the laser light along a width direction of the line-shape, and

said light pipe comprises two reflective surfaces facing to each other.

23. The laser irradiation apparatus according to claim 22, wherein said laser oscillator is an excimer laser, a YAG laser, or a glass laser.

24. The laser irradiation apparatus according to claim 22, wherein said laser oscillator is a YVO_4 laser, a YLF laser, or an Ar laser.

25. A method of manufacturing a semiconductor device, comprising the steps of:

forming a non-single-crystal semiconductor film on a substrate;

generating a laser beam with a laser beam oscillator;

using at least a cylindrical lens array and a light guide to shape the laser beam so as to form a linear beam spot of a laser light on an irradiated surface with its energy distribution homogenized;

setting the substrate with the non-single-crystal semiconductor film formed thereon on a stage to make a surface of the non-single-crystal semiconductor film coincide with the irradiated surface; and

performing a laser annealing of the non-single-crystal semiconductor film by irradiating the semiconductor film surface with the linear laser beam while causing said stage to scan relative to the laser beam,

wherein said cylindrical lens array acts on the linear beam spot along a length direction of the spot, and

said light guide acts on the linear beam spot along a width direction of the spot.

26. The method of manufacturing a semiconductor device according to claim 25, wherein said laser beam oscillator is an excimer laser, a YAG laser, or a glass laser.

27. The method of manufacturing a semiconductor device according to claim 25, wherein said laser beam oscillator is a YVO_4, a YLF laser, or an Ar laser.

28. A method of manufacturing a semiconductor device, comprising the steps of:

forming a non-single-crystal semiconductor film on a substrate;

generating a laser beam with a laser beam oscillator;

using at least a cylindrical lens array and a light guide to shape the laser beam so as to form a linear beam spot of a laser light on an irradiated surface with its energy distribution homogenized;

setting the substrate with the non-single-crystal semiconductor film formed thereon on a stage to make a surface of the non-single-crystal semiconductor film coincide with the irradiated surface; and

performing a laser annealing of the non-single-crystal semiconductor film by irradiating the semiconductor film surface with the linear laser beam while causing said stage to scan relative to the laser beam,

wherein said cylindrical lens array acts on the linear beam spot along a length direction of the spot,

said light guide acts on the linear beam spot along a width direction of the spot, and

said light guide comprises two reflective surfaces facing to each other.

29. The method of manufacturing a semiconductor device according to claim 28, wherein said laser beam oscillator is an excimer laser, a YAG laser, or a glass laser.

30. The method of manufacturing a semiconductor device according to claim 28, wherein said laser beam oscillator is a YVO_4, a YLF laser, or an Ar laser.

31. A method of manufacturing a semiconductor device, comprising the steps of:

forming a non-single-crystal semiconductor film on a substrate;

generating a laser beam with a laser beam oscillator;

using at least a cylindrical lens array and a light pipe to shape the laser beam so as to form a linear beam spot of a laser light on an irradiated surface with its energy distribution homogenized;

setting the substrate with the non-single-crystal semiconductor film formed thereon on a stage to make a surface of the non-single-crystal semiconductor film coincide with the irradiated surface; and

performing a laser annealing of the non-single-crystal semiconductor film by irradiating the semiconductor film surface with the linear laser beam while causing said stage to scan relative to the laser beam,

wherein said cylindrical lens array acts on the linear beam spot along a length direction of the spot, and

said light pipe acts on the linear beam spot along a width direction of the spot.

32. The method of manufacturing a semiconductor device according to claim 31, wherein said laser beam oscillator is an excimer laser, a YAG laser, or a glass laser.

33. The method of manufacturing a semiconductor device according to claim 31, wherein said laser beam oscillator is a YVO_4, a YLF laser, or an Ar laser.

34. A method of manufacturing a semiconductor device, comprising the steps of:

forming a non-single-crystal semiconductor film on a substrate;

generating a laser beam with a laser beam oscillator;

using at least a cylindrical lens array and a light pipe to shape the laser beam so as to form a linear beam spot of a laser light on an irradiated surface with its energy distribution homogenized;

setting the substrate with the non-single-crystal semiconductor film formed thereon on a stage to make a surface of the non-single-crystal semiconductor film coincide with the irradiated surface; and

performing a laser annealing of the non-single-crystal semiconductor film by irradiating the semiconductor film surface with the linear laser beam while causing said stage to scan relative to the laser beam,

wherein said cylindrical lens array acts on the linear beam spot along a length direction of the spot,

said light pipe acts on the linear beam spot along a width direction of the spot, and

said light pipe comprises two reflective surfaces facing to each other.

35. The method of manufacturing a semiconductor device according to claim 34, wherein said laser beam oscillator is an excimer laser, a YAG laser, or a glass laser.

36. The method of manufacturing a semiconductor device according to claim 34, wherein said laser beam oscillator is a YVO_4, a YLF laser, or an Ar laser.

37. A method of manufacturing a semiconductor device comprising:

providing a laser light;

passing said laser light through a light guide; and

irradiating a semiconductor film with said laser light after passing through said light guide to crystallize said semiconductor film,

wherein an energy distribution of the laser light at a surface of said semiconductor film is homogenized by said light guide.

38. The method of manufacturing a semiconductor device according to claim 37, wherein said light guide comprises two reflective surfaces facing to each other.

39. A method of manufacturing a semiconductor device comprising:

providing a laser light;

passing said laser light through a light pipe; and

irradiating a semiconductor film with said laser light after passing through said light pipe to crystallize said semiconductor film,

wherein an energy distribution of the laser light at a surface of said semiconductor film is homogenized by said light pipe.

40. The method of manufacturing a semiconductor device according to claim 39, wherein said light pipe comprises two reflective surfaces facing to each other.

41. A method of manufacturing a semiconductor device comprising:

providing a laser light having a cross section perpendicular to a propagation direction of said laser light wherein said cross section has a length and a width;

increasing only the length of the cross section of the laser light;

passing said light through a light guide; and

irradiating a semiconductor film with said light after passing through said light guide to crystallize said semiconductor film,

wherein an energy distribution of the laser light along a width direction of said cross section is homogenized by said light guide.

42. A method according to claim 41, wherein the length of the cross section of the laser light is increased by using a cylindrical lens array having a plurality of cylindrical lenses.

43. The method of manufacturing a semiconductor device according to claim 41, wherein said light guide comprises two reflective surfaces facing to each other.

44. A method of manufacturing a semiconductor device comprising:

providing a laser light having a cross section perpendicular to a propagation direction of said laser light wherein said cross section has a length and a width;

increasing only the length of the cross section of the laser light;

passing said light through a light pipe; and

irradiating a semiconductor film with said light after passing through said light pipe to crystallize said semiconductor film,

wherein an energy distribution of the laser light along a width direction of said cross section is homogenized by said light pipe.

45. A method according to claim 44, wherein the length of the cross section of the laser light is increased by using a cylindrical lens array having a plurality of cylindrical lenses.

46. The method of manufacturing a semiconductor device according to claim 44, wherein said light pipe comprises two reflective surfaces facing to each other.